



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,537	10/15/2004	Sverker Hanson	100647-1P	4417

22466 7590 04/27/2007  
ASTRA ZENECA PHARMACEUTICALS LP  
GLOBAL INTELLECTUAL PROPERTY  
1800 CONCORD PIKE  
WILMINGTON, DE 19850-5437

EXAMINER

BERCH, MARK L

ART UNIT PAPER NUMBER

1624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/511,537

Applicant(s)

HANSON ET AL.

Examiner

Mark L. Berch

Art Unit

1624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/15/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The last phrase in claim 1 is of unknown meaning. There is no way that the scope of this can be determined. Deletion of the term is suggested, since a pill is still a pill regardless of what intended purpose it has. Intention is just a mental step and does not limit the scope of the claim.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The "converting" in the third from last line of claim 12 is of unknown meaning, since the nature of the transformation is unspecified. For example, if R1=butyl were being converted into R1=pentyl, what would this consist of?

The phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Art Unit: 1624

Claims 1-6 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-6 and 10 provides for the use of certain compounds, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

*Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6 and 10 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Because of the use of the phrase "in the manufacture of a medicament", these claims are taken, for examination purposes, to be drawn to compounding, i.e. the preparation of a medicinal composition such as a pill.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1624

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by WO

96/18400.

See page 24, species at lines 5-7, 10-12, 22, 24 and 25, as well as page 7, species at lines 16, 20 and 26. These all fall within the claim 1 genus in which  $Y=S$  and  $X=O$ . In addition, the species at page 7, line 13 corresponds to  $X=Y=S$  and the species at line 14 corresponds to  $X=S$ ,  $Y=O$  (and thus anticipates claim 3). The compounds are anti-inflammatory agents, and the making of the compositions is described on pages 13-14. The claims are drawn to the making of e.g. a pill. A pill is still the same pill regardless of what purpose the pill is to be put to.

Claims 1-2, 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by 6066641.

This reference is similar to the above. Note claim 7, 3<sup>rd</sup>, 4<sup>th</sup> and 6<sup>th</sup> species, in which  $Y=S$  and  $X=O$ .

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by 6025361.

This reference has yet more species. See species tested in examples 14-15, except for the 8-cyclopryl and the 1-(Cl-benzyl) compounds.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by 3135753.

See Formula 1, first choice for Z, and all 5 examples. These are disclosed as medicaments for heart problems.

Claims 1-2, 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by 6319298.

See most of the species in Table 5, which are drawn to  $X=Y=S$ ,  $R3=H$  species.

Claims 1-2, 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Garst.

The reference is discussed below in the 103 rejection. This species does anticipate.

Art Unit: 1624

Claims 1-2, 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Armitage.

See the bronchodilators of Table 1. The compounds are also coronary dilators, diuretics and have other properties as well. All of the species with X=S except 7, 17 and 20 anticipate.

The above is just a sampling of art relevant to claim 1.

Claims 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Woo.

Compound 6h is the same species as the 4<sup>th</sup> from the last compound in claim 9.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over 6319298.

Species 7 in claim 9 is drawn to the 3-isobutyl compound. In column 36, note the 4<sup>th</sup> species, which is the n-butyl. This is a position isomer. It is well established that position isomers are prima facie structurally obvious even in the absence of a teaching to modify. The isomer is expected to be preparable by the same method and to have generally the same properties. This expectation is then deemed the motivation for preparing the position isomers. This circumstance has arisen many times. See: *Ex parte Englehardt*, 208 USPQ 343, 349; *In re Mehta*, 146 USPQ 284, 287; *In re Surrey*, 138 USPQ 67; *Ex Parte Ulliyot*,

Art Unit: 1624

103 USPQ 185; *In re Norris*, 84 USPQ 459; *Ex Parte Naito*, 168 USPQ 437, 439; *Ex parte Allais*, 152 USPQ 66; *In re Wilder*, 166 USPQ 545, 548; *Ex parte Henkel*, 130 USPQ 474; *Ex parte Biel*, 124 USPQ 109; *In re Petrzilka*, 165 USPQ 327; *In re Crownse*, 150 USPQ 554; *In re Fouche*, 169 USPQ 431; *Ex parte Ruddy*, 121 USPQ 427; *In re Wiechert*, 152 USPQ 247, *In re Shetty*, 195 USPQ 753; *In re Jones*, 74 USPQ 152, 154.

For example, "Position isomerism has been used as a tool to obtain new and useful drugs" (Englehardt) and "Position isomerism is a fact of close structural similarity" (Mehta, emphasis in the original). Note also *In re Jones*, 21 USPQ2d 1942, which states at 1943 "Particular types or categories of structural similarity without more, have, in past cases, given rise to *prima facie* obviousness"; one of those listed is "adjacent homologues and structural isomers". Position isomers are the basic form of close "structural isomers." Similar is *In re Schechter and LaForge*, 98 USPQ 144, 150, which states "a novel useful chemical compound which is homologous or isomeric with compounds of the prior art is unpatentable unless it possesses some unobvious or unexpected beneficial property not possessed by the prior art compounds." Note also *In re Deuel* 34 USPQ2d 1210, 1214 which states, "Structural relationships may provide the requisite motivation or suggestion to modify known compounds to obtain new compounds ... a known compound may suggest its analogs or isomers, either geometric isomers (cis v. trans) or position isomers (e.g., ortho v. para)." See also MPEP 2144.09, second paragraph.

In addition, note the 4<sup>th</sup> from last species, which is the 2-methylbutyl. This is the same as the isopropyl, but with an extra carbon, and hence a homolog. Compounds that differ only by the presence or absence of an extra methyl group or two are homologues. Homologues are of such close structural similarity that the disclosure of a compound

Art Unit: 1624

renders *prima facie* obvious its homologue. As was stated in *In re Grose*, 201 USPQ 57, 63, “The known structural relationship between adjacent homologues, for example, supplies a chemical theory upon which a *prima facie* case of obviousness of a compound may rest.” The homologue is expected to be preparable by the same method and to have generally the same properties. This expectation is then deemed the motivation for preparing homologues. Of course, these presumptions are rebuttable by the showing of unexpected effects, but initially, the homologues are obvious even in the absence of a specific teaching to add or remove methyl groups. See *In re Wood*, 199 USPQ 137; *In re Hoke*, 195 USPQ 148; *In re Lohr*, 137 USPQ 548; *In re Magerlein*, 202 USPQ 473; *In re Wiechert*, 152 USPQ 247; *Ex parte Henkel*, 130 USPQ 474; *In re Jones*, 74 USPQ 152, 154; *In re Herr*, 134 USPQ 176; *Ex parte Dibella*, 157 USPQ 59; *In re Zickendraht*, 138 USPQ 22; *Ex Parte Fischer*, 96 USPQ 345; *In re Fauque*, 121 USPQ 425; *In re Druey*, 138 USPQ 39; *In re Bowers and Orr*, 149 USPQ 570. In all of these cases, the close structural similarity between two compounds differing by one or two methyl groups was itself sufficient show obviousness. As was stated directly in *THE GENERAL TIRE & RUBBER COMPANY v. JEFFERSON CHEMICAL COMPANY, INC.*, 182 USPQ 70 (1974): “If any structural change is obvious to one skilled in the art, a substitution of the next higher homolog would seem to be.” Note also *In re Jones*, 21 USPQ2d 1942, which states at 1943 “Particular types or categories of structural similarity without more, have, in past cases, given rise to *prima facie* obviousness”; one of those listed is “adjacent homologues and structural isomers”. Similar is *In re Schechter and LaForge*, 98 USPQ 144, 150, which states “a novel useful chemical compound which is homologous or isomeric with compounds of the prior art is



Art Unit: 1624

unpatentable unless it possesses some unobvious or unexpected beneficial property not possessed by the prior art compounds."

The compounds are PDE 5 inhibitors.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garst.

Garst is one of many references teaching the adenosine antagonist MIX, seen in Formula 1. The utility of the compound is set forth in the first paragraph. Compound 3 in claim 9 is just the homolog, with an additional methyl group at the 8-position. This is obvious for reasons set forth in the above rejection.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Galen et al.

See compound 76, which binds to all three adenosine receptors. Compound 6 is just a homolog, having only an extra methyl group. Compounds 8, 9 and 13 are also homologs, having 2 extra methyl groups, one on the propyl chain and the other at the 8-position, 7-position and 1-position respectively. This is obvious as a homolog for reasons set forth in the 6319298 rejection.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Armitage.

See compound 6, and note discussion of the reference above. This differs from the third claim 9 species only in that compound 6 lacks the methyl group at the 8-position. This is obvious as a homolog for reasons set forth in the 6319298 rejection. In addition, the reference itself has a species with a methyl at the 8-position --- see compound 24. Note that among the thiotheophyllines, compound 6 was listed as the most active coronary dilator,

Art Unit: 1624

and one of the 4 most active bronchodilators (page 197, middle paragraph), so it is natural that one of ordinary skill in the art would seek this one to improve.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/18400.

See the species at page 24, line 10. This is a homolog of the 5<sup>th</sup> species of claim 9. Applicants have one extra methyl at the 3-position, and one fewer methyl at the 8-position, and hence is a homolog, obvious for the reasons set forth above.

#### *Claim Objections*

Claims 4-6 objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on a claim (here, claim 3) which is itself multiply dependent. See MPEP § 608.01(n).

Claim 12 is dependent on both claim 1 and either 8 or 9, which is improper.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Berch whose telephone number is 571-272-0663. The examiner can normally be reached on M-F 7:15 - 3:45.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on (571)272-0661. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1624

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Mark L. Berch  
Primary Examiner  
Art Unit 1624

4/25/2007